

We claim:

1 1. A coated fuel cell bipolar plate comprising:
2 a metal plate including an outer surface;
3 an electrically conductive coating over the outer
4 surface; and
5 an overcoating formed over the coating, the
6 overcoating including graphite.

1 2. A coated fuel cell bipolar plate as claimed in
2 claim 1, wherein the metal plate is formed with aluminum.

1 3. A coated fuel cell bipolar plate as claimed in
2 claim 1, wherein the coating is a graphite emulsion. *(bind)*
anti-corrosion, surfactant

1 4. A coated fuel cell bipolar plate as claimed in
2 claim 1, wherein the coating includes graphite particles
3 in an organic suspension *same as 3*

1 5. A coated fuel cell bipolar plate as claimed in
2 claim 1, wherein the overcoating includes exfoliated
3 graphite. *(thin layers, flakey, porous)*

1 6. A coated fuel cell bipolar plate as claimed in
2 claim 1, wherein the overcoating includes porosities that
3 are filled by the coating.

1 7. A coated fuel cell bipolar plate as claimed in
2 claim 1, wherein the overcoating is a foil.

1 8. A coated fuel cell bipolar plate as claimed in
2 claim 1, wherein the overcoating includes particulate

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3 graphite flakes which have been processed through an
4 intercalation process.

1 9. A coated fuel cell bipolar plate as claimed in
2 claim 1, wherein the overcoating is electrically
3 conductive.

1 10. A coated fuel cell bipolar plate as claimed in
2 claim 1, wherein the overcoating is hydrophobic.

1 11. A coated fuel cell bipolar plate as claimed in
2 claim 1, wherein the overcoating is anisotropic.

1 12. A coated fuel cell bipolar plate as claimed in
2 claim 1, wherein the overcoating has a thickness
3 approximately between 0.04 and 1.0 millimeters.

1 13. A method of manufacturing a coated bipolar plate
2 for a fuel cell, the method comprising the steps of:
3 providing a metal plate with an outer surface;
4 providing an electrically conductive coating over the
5 outer surface; and
6 providing an overcoating over the coating, the
7 overcoating including graphite.

1 14. A method as claimed in claim 13, wherein the
2 coating is an emulsion, suspension or paint including
3 graphite particles. (DAGTM) Acheson

1 15. A method as claimed in claim 13, wherein the
2 overcoating includes exfoliated graphite.

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1 16. A method as claimed in claim 13, wherein the
2 step of providing the overcoating includes pressing at
3 least one sheet of graphite foil over the coating.

1 17. A method as claimed in claim 16, wherein the
2 metal plate is heated during the pressing step.

1 18. A method as claimed in claim 13, further
2 comprising the step of:
3 forming a flow field on the overcoating.

1 19. A method as claimed in claim 13, further
2 comprising the step of:
3 mechanically deforming the metal plate, the coating
4 and the overcoating to create a flow field.

1 20. A method of manufacturing a coated bipolar plate
2 for a fuel cell, the method comprising the steps of:
3 providing a metal plate with an outer surface;
4 providing an electrically conductive coating over the
5 outer surface; and
6 providing an overcoating over the coating, the
7 overcoating being electrically conductive and hydrophobic.